

Claims:

1. An interferometric device for measuring an out-of-plane deformation of an object surface, comprising:

5 means for producing successive interferograms at a predetermined nominal rate of phase change from a light beam reflected from the object surface;

means for implementing an algorithm for interferometric analysis of said interferograms; and

10 means for changing said predetermined nominal rate such that each phase change between successive data-acquisition frames falls within an operational window of the algorithm.

2. The device of Claim 1, wherein said means for producing
15 successive interferograms includes a scanner operating at said predetermined nominal rate of phase change.

3. The device of Claim 1, wherein said means for producing
20 successive interferograms includes a light detector triggered at said predetermined nominal rate of phase change.

4. The device of Claim 1, wherein said means for acquiring successive interferograms includes a light source capable of varying a wavelength to produce said predetermined nominal rate of phase change.

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5. The device of Claim 1, wherein said means for acquiring successive interferograms includes a means for changing an index of refraction along an optical path of the interferometric device to produce said predetermined nominal rate of phase change.

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6. The device of Claim 1, wherein said means for acquiring successive interferograms includes a means for changing a polarization state of an interfering light beam to produce said predetermined nominal rate of phase change.

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7. The device of Claim 1, wherein said means for acquiring successive interferograms includes a tilting plate used to produce said predetermined nominal rate of phase change.

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8. The device of Claim 1, wherein said means for acquiring successive interferograms includes a tilting grating used to produce said predetermined nominal rate of phase change.

9. The device of Claim 2, wherein said means for changing said predetermined nominal rate comprises a driving signal operating on the scanner.

5 10. The device of Claim 1, wherein said means for changing said predetermined nominal rate comprises a driving signal operating on a sample stage.

10 11. The device of Claim 1, wherein said means for changing said predetermined nominal rate comprises a driving signal operating on a reference mirror of the interferometric device.

15 12. The device of Claim 1, wherein said means for changing said predetermined nominal rate comprises a driving signal operating on an objective of the interferometric device.

13. The device of Claim 1, further comprising a reference signal circuit applied to said means for acquiring successive interferograms.

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14. The device of Claim 1, wherein said means for changing the predetermined nominal rate is applied uniformly throughout the object surface.

15. The device of Claim 1, wherein said means for changing the predetermined nominal rate is applied non-uniformly on the object surface as a function of said out-of-plane deformation thereof.

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16. The device of Claim 1, wherein said means for changing the predetermined nominal rate includes a substantially linear component combined with the nominal rate.

10 17. The device of Claim 1, wherein said means for changing the predetermined nominal rate includes a substantially periodic component combined with the nominal rate.

15 18. A method for measuring an out-of-plane deformation of an object surface using an interferometric device, comprising the following steps:

acquiring successive interferograms produced at a predetermined nominal rate of phase change from a light beam reflected from said object surface;

20 implementing an algorithm for interferometric analysis of said interferograms; and

changing said predetermined nominal rate such that each phase change between successive data-acquisition frames falls within an operational window of the algorithm.

19. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a scanner operating at said predetermined nominal rate of phase change.

5 20. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a light detector triggered at said predetermined nominal rate of phase change.

10 21. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a light source capable of varying a wavelength to produce said predetermined nominal rate of phase change.

15 22. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a means for changing an index of refraction along an optical path of the interferometric device to produce said predetermined nominal rate of phase change.

20 23. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a means for changing a polarization state of an interfering beam to produce said predetermined nominal rate of phase change.

24. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a means for shifting projected fringes to produce said predetermined nominal rate of phase change.

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25. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a tilting plate to produce said predetermined nominal rate of phase change.

10 26. The method of Claim 18, wherein said step of acquiring successive interferograms is carried out with a tilting grating to produce said predetermined nominal rate of phase change.

15 27. The method of Claim 19, wherein said step of changing said predetermined nominal rate is carried out with a driving signal operating on the scanner of the interferometric device.

28. The method of Claim 19, wherein said scanner actuates an objective of the interferometric device.

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29. The method of Claim 19, wherein said scanner actuates a sample stage of the interferometric device.

30. The method of Claim 19, wherein said scanner actuates a reference mirror of the interferometric device.

31. The method of Claim 18, further comprising the step of
5 applying a reference signal to said means for acquiring successive interferograms.

32. The method of Claim 18, wherein said step of changing the predetermined nominal rate is applied uniformly throughout the
10 object surface.

33. The method of Claim 18, wherein said step of changing the predetermined nominal rate is carried out non-uniformly on the object surface as a function of said out-of-plane deformation
15 thereof.

34. The method of Claim 18, wherein said step of changing the predetermined nominal rate includes the use of a substantially linear component combined with the nominal rate.

20 35. The method of Claim 18, wherein said step of changing the predetermined nominal rate includes the use of a substantially periodic component combined with the nominal rate.

36. The method of Claim 18, wherein said step of acquiring successive interferograms at a predetermined nominal rate of phase change is carried out with a strobed light.

5 37. The method of Claim 18, wherein said step of changing said predetermined nominal rate such that each phase change between successive data-acquisition frames falls within an operational window of the algorithm is carried out with a feedback signal based on said out-of-plane deformation of the object surface.

10 38. The method of Claim 18, wherein said step of changing said predetermined nominal rate such that each phase change between successive data-acquisition frames falls within an operational window of the algorithm is carried out with a feedback signal
15 based on a prior knowledge of said out-of-plane deformation of the object surface.